Negroes of the Nile Valley and some Hamitic people. The information furnished was collected in the first instance for administrative purposes. It consequently relates chiefly to such matters as would come more directly under the notice of a British official in the early stages of the settlement of the country. Mr. Hobley has in regard to such matters been minute and careful in his inquiries. He has made an excellent beginning, though, as he himself says, "it would be presumptuous to suppose that [his] observations do more than touch the fringe of inquiry into the habits and customs of these interesting people." As examples of the painstaking manner in which he has collected his material, his plans of the Kavirondo and Nandi huts, and his figures, placed side by side, of the hoe (the principal agricultural implement of the continent) used by the Kavirondo and that used by the Nandi, may be referred to. By the courtesy of the Anthropological Institute we are enabled to reproduce these.

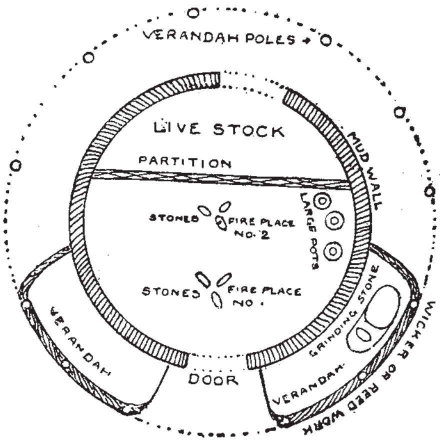

FIG. 1.—Plan of Kavirondo Hut.

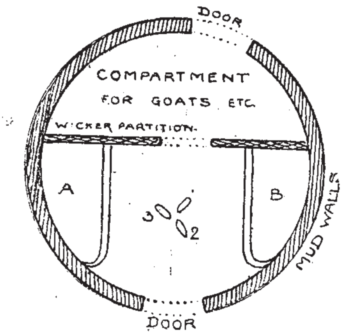

FIG. 2.—Plan of Nandi Hut.

The externals of native life and the outline of their customs, especially the customs relating to marriage and married life, are most fully treated. But there is evidently much detail still to be ascertained, and the underlying beliefs call for inquiry. The social organisation is hardly touched. Mr. Hobley's use of the words *clan* and *tribe* lacks precision. Both words seem to be used territorially; the clan is a local subdivision of the tribe, under a subordinate chief. By anthropologists the word *clan* is now generally used to indicate blood-relationship, actual or imputed. It should be kept strictly for this purpose and some other word found for a village settlement or other local subdivision the inhabitants of which may or may not be held to be blood-brothers. The important subject of religion, so intimately connected with social organisation, is almost a blank. The details concerning divination by the entrails of animals slain (in sacrifice?) and concerning the ceremonies in making peace, however, are interesting and valuable. These are matters likely to have come frequently under the sub-commissioner's eye. On the other hand, he is not likely to have suffered much from the medical practice of the Kavirondo. Hence his account of it is not very illuminating. The anthropologist who reads that the old women who are called in "put pebbles in a gourd and rattle them, and then advise certain remedies," will suspect that the pebbles are not only put into the gourd, but thrown out like dice, and that the practitioner divines from their fall, as among the more southerly Bantu, what is the matter and what remedies, if any, are to be prescribed. Probably Mr. Hobley has never witnessed the ceremony but writes from imperfect information. Useful plates of the Ja-luo are provided, and a plate of three Masai warriors. But nothing in the way of physical measurement has been attempted. Physical descriptions are vague, and evidence of race is chiefly made to rest on the deceptive basis of language. There is an excellent map of the district, showing the distribution of the various tribes. Vocabularies of several of the languages and grammatical observations are appended.

I have called attention to some of the deficiencies of this "Survey," not by any means for the purpose of finding fault, but in the hope that Mr. Hobley, who has commenced so well, will be induced to prosecute the work still further. Such investigations ought to have the most strenuous encouragement on the part of the administration, both for scientific purposes (to which no administration ought to be indifferent) and because everything that contributes to our knowledge of the people, their physical and mental capacities, their prejudices, customs and beliefs must make for good government. E. SIDNEY HARTLAND.

NOTES.

PROF. W. H. HOLMES, head curator for anthropology of the National Museum, has been appointed chief of the United States Bureau of Ethnology at Washington in succession to the late Major J. W. Powell, the former director. Prof. Holmes is well known to anthropologists for his studies on the pottery and decorative art of the aborigines of America, and on the manufacture of stone implements, &c. He has also decided and advanced views on the arrangement of ethnological museums.

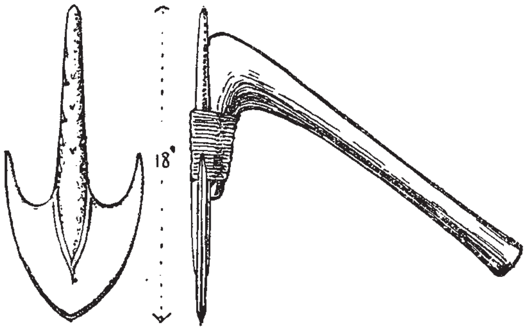

FIG. 3.—Kavirondo Hoe.

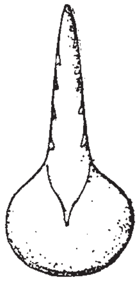

FIG. 4.—Nandi Hoe.

THE Lancaster Town Council has decided to confer the honorary freedom of the borough upon Mr. James Mansergh, F.R.S., past president of the Institution of Civil Engineers, who is a native of the borough.

LAST week the Bangor Eisteddfod Committee voted from its surplus a sum of 30*l.* to the University College of North Wales to assist in the development of the fisheries department.

In September Prof. White arranged for a fisheries exhibit in the arts and science section of the Eisteddfod, and partly owing to this as well as to the good work which the College has been doing in connection with the Welsh fisheries, the Committee decided to make the grant. The sum will be utilised in developing the fisheries collection at the College, which is in course of formation.

A RICH collection of Babylonian antiquities has been presented by the Sultan to Prof. Hilprecht, head of the archæological department of the University of Pennsylvania, in recognition of the services rendered by him to the Imperial Museum at Constantinople. Prof. Hilprecht has placed the collection in the University Museum.

A TELEGRAM from Kingstown, St. Vincent, published in the *Times*, says:—"The British botanists, Messrs. Powell, Quinton and Foster, spent an hour and a half on the summit of the Soufrière on October 28. The crater was then active, emitting steam and ashes. The new crater showed no signs of recent eruption. There was a slight eruption that night, and the disturbances continue, causing much excitement at Georgetown, where the tremors are continually felt."

MR. JOSEPH CLARK writes from Street, Somerset, to confirm Mr. Clayden's observations of recent remarkable sunsets (p. 659). On Friday, October 24, very brilliant colours were seen and particular notice was taken of the long time during which the clouds to the south-east retained a rosy tint. On Tuesday, October 28, there was a fine display of bright rose-colour on the eastward rolling clouds, an effect also noticed at Paris on the same evening.

WE regret to record the death, on October 23, of Mr. William Gunn, F.G.S. Mr. Gunn joined the staff of the Geological Survey in 1867 as assistant geologist, and attained the rank of district geologist in 1901. He was engaged during his long service in Durham and Northumberland, in the Scottish Highlands and latterly in Arran; and the results of his work appear for the most part in the maps and memoirs of the Geological Survey. His discovery of remnants of Secondary fossiliferous strata in a volcanic vent in Arran was brought before the Geological Society last year. Mr. Gunn had quite recently retired from the public service, having attained the age of sixty-five.

THE Thomson foundation gold medal of the Royal Geographical Society of Australasia, Queensland, will be awarded to the author of the best original paper (provided it be of sufficient merit) on each of the following subjects, the papers to be sent in by the dates named:—(1) The commercial development, expansion and potentialities of Australia—or, briefly put, the commerce of Australia (July 1, 1903); (2) the pastoral industry of Australia, past, present and probable future (July 1, 1904); (3) the geographical distribution of Australian minerals (July 1, 1905); (4) the agricultural industry of Australia (July 1, 1906). The competition is open to members and non-members of the Society alike, whether residing in Australasia or elsewhere.

SOME of the services which medical science has rendered to the State were referred to last week by Lord Roberts in an address delivered at the annual meeting for the distribution of the prizes gained during the past year by the students of the St. George's Hospital Medical School. Lord Roberts remarked that no section of the public was more deeply interested in the work and in the scientific researches of the medical profession than soldiers. were, and that a deep debt of gratitude was due to those who, by their constant study, earnest inquiry and careful experiments, learned and taught how to heal the sick, to tend the wounded, to alleviate pain and suffering, to fight sickness and disease and to maintain health in camp and in quarters. A comparison of statistics as to the loss by sickness and disease in the Crimea and during the war in South Africa showed what a changed and improved condition of things prevailed now, changes and improvements which were largely due to the march of medical science. If great results were to be achieved, if success was to be won, there must be no slacking off in any pursuit or profession nowadays, least of all in the professions of medicine and surgery. Fresh fields in many directions remained to be explored, fresh developments to be observed and followed up, fresh results to be recorded.

IT was announced on the reopening of the House of Commons Committee dealing with the London electric railways that the Bill promoted by the London United Railways for a "tube" from Hammersmith to Piccadilly would be withdrawn (see NATURE, vol. lxvi. p. 296). This railway was intended to provide, with the Piccadilly and City and North-East London Railways, a through route from west to north-east, linking the tramway system of the London United Tramways with the City.

THE last link of the Pacific cable was completed at the end of last week, and it is hoped that it will very soon be opened for public traffic. The Pacific Cable Board does not, however, assume responsibility until thirty days after completion. The completion of this cable marks another step forward in cable enterprise. It is more than 8000 miles long, and is built up in five sections as follows:—Vancouver to Fanning Island (3653 miles), thence to Fiji (2181 miles), to Norfolk Island (1019 miles), and then to Moreton Bay, Queensland (906 miles) and New Zealand (513 miles). The cable has been laid by the Telegraph Construction and Maintenance Company at a contract price of rather under 2,000,000*l*., and in less than two years; it is comforting to reflect that England still stands preeminent in this branch of electrical engineering. The completion of the line was made the occasion of the exchange of congratulatory messages between Mr. Chamberlain and the different governors of interested colonies. Among the most interesting of these are two sent by Sir Sandford Fleming to Lord Minto; these completely circled the world, one, in an easterly direction, in 10h. 25m., and the other, going westerly, in thirteen hours and a half. We have still some progress to make before we are able with Puck to "put a girdle round about the earth in forty minutes."

THE presidential address delivered by Mr. J. C. Hawkshaw before the Institution of Civil Engineers on Tuesday covered a wide range of subjects, among them being docks, timber and forestry, canals, means of traffic and transport, the world's supply of fuel, water-power available for industrial uses, and the value of purely scientific studies to the engineer. Upon the latter point, Mr. Hawkshaw made the following remarks at the end of his address:—"Wherever our work may take us we have always something at hand to observe if we give some thought to geology or some branch of biology. Geology calls to its aid all sciences; biology, even botany, is not one, but many sciences. Every science and every question of science is first a matter of fact. Facts observed which seem trivial in themselves may lead to much. Reaumur it was who first suggested that wood-fibre should be used for making paper. He was led to do so from observing the structure of wasps' nests. Out of that observed fact a great industry has grown which threatens to tax the forest supplies of the world. If we accept the view of M. Maurice Levy that from the study of celestial mechanics was derived later general mechanics, then all our progress has come from the study of what was useless at the time it was studied. We might well, I think, increase the number of optional subjects for our examinations. There is no branch of natural knowledge which may not be studied with advantage by an engineer as a change and relaxation in the round of daily work, and as a training of his power of observation. For after all is said, it is only by observing that we can know."

AT a meeting of the Society of Engineers held on Monday, November 3, a paper was read on "The Effect of Segregation on the Strength of Steel Rails" by Mr. Thomas Andrews, F.R.S. In the course of the paper, the nature and primary causes of segregation in steel rails were described, and the influences of local transverse and longitudinal segregation on the loss of strength in such rails was demonstrated. Microscopic studies have specially indicated some of the latent sources of weakness which occur in segregated steel rails leading to their premature fracture in main-line service. Numerous chemical, physical and high-power microscopic examinations have been made on a considerable number of rails in which local segregation of some of the chemical constituents had been detected, and the author's investigations have demonstrated that local segregation of this nature distinctly reduces the general physical strength and main-line endurance of steel rails in which segregation exists. Reference was also made to the importance, in the interests of public safety, of detecting and eliminating from service, so far as practicable, rails having a tendency to segregated chemical composition.

SIR CHARLES TODD, Government Astronomer of South Australia, has published his valuable report on the rainfall of the colony for the year 1899, showing the monthly and yearly amounts and the averages for previous years at a large number of stations. The report is illustrated by maps showing clearly at a glance the rainfall characteristics of the year. Very few stations registered their average amount, principally owing to the failure of the rains during the latter part of the winter (July and August) and in October and December. The report contains a table showing the yearly rainfall at Adelaide for sixty-one years, 1839 to 1899, and the years when the fall was above or below the normal amount (20·85 inches).

WE have received from Dr. H. Hergesell, president of the International Aëronautical Committee, a preliminary report of the balloon ascents made during the three months April to June last. Austro-Hungary, France, Germany and Russia took part in the investigation, and twenty-one ascents were made. The following were the greatest altitudes attained by the unmanned balloons:—April 3, Itteville (near Paris), 14,260 metres, minimum temperature −60°·7 C., temperature at starting 7°. May 1, Berlin, 19,564 m., lowest reading −58°·5, on ground 6°·8. June 5, Berlin, 16,750 m., −58°·2, 18°·4. Vienna, 10,480 m., −62°·8, 15°. The greatest heights attained by manned balloons were in ascents from Berlin:—

April,	5403 m.,	temperature	−19°·4,	at starting	6°·6
May,	5510 m.,	,,	−30°·5,	,,	6°·2
June,	5936 m.,	,,	−18°·0,	,,	20°·9

In the latter case the observers were Dr. Berson, and Prof. Palazzo, of Rome. On each occasion Mr. Rotch sent up kites from his observatory at Blue Hill, near Boston, U.S. On the days of the ascents, areas of low barometric pressure lay over western Europe in April and May, and an area of high barometric pressure in June.

IN his report for the year 1900–1, the first volume of which is now to hand, the chief of the U.S. Weather Bureau directs attention to an important extension of the forecast work of the Bureau made during the year with which the report is concerned. At the end of 1900 was begun, by an arrangement with our own Meteorological Office, the transmission by cable from London to Washington of meteorological reports from certain observing stations in the British Isles and on the continent of Europe, and from Ponta Delgada, Azores. These reports, with observations from Nassau, Bermuda and Turks Island, have been regularly published on the daily weather maps issued at Washington, Baltimore, Philadelphia, New York and Boston, together with forecasts of the force and direction of the wind and the state of the weather for the first three days out of steamers bound east from American ports. Arrangements were also made with Portugal towards the end of 1900 for the receipt at Washington of reports from the meteorological observatory at Horta, in the Azores. Observations are now regularly transmitted by cable from this place, and have proved of much value in the work of forecasting the movements of storms on the Atlantic Ocean.

THE Imperial Department of Agriculture for the West Indies has issued a Report on certain economic experiments conducted in connection with the Antigua Botanic Station during the period from May, 1901, to April, 1902. Considerable variation was shown in the crop results, to a great extent attributable to the abnormally wet season, the year's rainfall amounting to 75·46 in., the total for the preceding year being 42·67 in. February was the only dry month. The experiments have for their objects the improvement of local food products, the introduction of new crops, and the placing on record of interesting facts bearing on insect and fungoid attacks, climatic conditions, &c. An investigation of the black-spot disease of pine-apples and of their rotting during transit to Europe has led to the conclusion that the former is due to injury, during the period of growth, from the attacks of a Penicillium, and the latter to injury, after cutting, from the attacks of *Trichosphaeria Sacchari* (rind fungus) and a species of Diplodia.

PROF. J. SCHNEIDER contributes an interesting paper, on the diurnal movements of the atmosphere at Hamburg, to the September number of the *Meteorologische Zeitschrift*. The wind observations published in the "Deutsche Meteorologische Jahrbuch" for the years 1887 to 1896 are dealt with by resolving into components in west-east and south-north directions, and the diagram of hourly movement shows that the daily curve is entirely closed, its form being egg-shaped, with the narrow end pointing north-east, and its total perimeter about 45 kilometres.

DR. A. SPRUNG describes a number of photographs of halos and parhelia, taken by him at Potsdam on March 23, in the August issue of the *Meteorologische Zeitschrift*. One of the photographs is reproduced. The phenomena are of special interest from the fact that they include both parhelia and the rare large halo, and that the dark spaces are indicated in the photographs. Measurements of the plates give the following mean results, which are compared with the means of direct measurements made by different observers:—

	Mean radius of small ring.		Distance of parhelia.		Mean radius of large ring.
Photograph...	22° 22′	...	23° 2′	...	46° 25′
Observers ...	22° 23′	...	24° 24′	...	46° 15′

THE problem of the representation by a finite number of parametric formulæ in two variables of the neighbourhood of a singular point of an algebraic surface was first solved in 1892 by Gustav Kobb, but his solution received criticism at the hands of Beppo Levi in 1897. Mr. C. W. M. Black, writing in the *Proceedings* of the American Academy of Arts and Sciences, now gives a new investigation of the problem, which is claimed not only to supply the deficiencies in Kobb's reasoning, but also to extend the discussion from the case of an algebraic surface to the more general case of any analytic surface whatever.

MR. C. H. HINTON has published, in the *Bulletin* of the Philosophical Society of Washington, a paper on the "Recognition of the Fourth Dimension." In it the author examines what would be the general character of the motions of bodies in space of four dimensions. The most interesting feature of this line of inquiry is the possibility which is pointed out of constructing representations of the phenomena of electromagnetism by means of vortex motions in four-dimensional space. Thus a vortex with a surface as its axis affords a geometric image of a closed circuit, and there are rotations which by their polarity afford a possible definition of static electricity. Has it occurred to the author that the property that electricity which is free to move in a conductor assumes a superficial distribution may enable us to form a conception of matter in four-dimensional space assuming a three-dimensional distribution?

THE work done by Prof. Barrett and Messrs. W. Brown and R. Hadfield on the properties of alloys of iron is of very high importance to all engineers, whether electrical or civil. The third part of a paper on the subject is published in the *Scientific Transactions* of the Royal Dublin Society for September; the two first parts were published in 1899. In the present section, non-magnetic alloys of iron and alloys more magnetic than best Swedish charcoal iron are considered. Manganese added to iron to the extent of about 13 per cent. gives an alloy which is practically non-magnetic; a still more remarkable effect is seen with manganese-nickel-steels; magnetic alloys of iron with manganese or nickel can be made non-magnetic by adding a suitable amount of the other metal. There is possibly a great future for such alloys in shipbuilding. The alloys more magnetic than the best commercial iron are made with nickel, silicon and aluminium. The authors suggest that an iron alloy containing silicon and aluminium will very probably prove to be the best material to use for transformers. The great value of this work is obvious, and we should like to be able to deal with it more fully; fortunately, the results are easily accessible, as a paper covering practically the same ground as all three of the Dublin papers was read by the authors before the Institution of Electrical Engineers last February (*Journal* I.E.E., vol. xxxi. p. 674).

THE Health Department of the City of London has had a number of samples of ice-creams bacteriologically examined. A large proportion of the samples was found to be unsatisfactory; in several micro-organisms were very numerous, while in some virulent organisms of the *Bacillus coli* type were present; one contained pyogenic organisms and produced abscesses in guinea-pigs, and another contained an anaërobic organism, perhaps the bacillus of malignant œdema. Many of the ice-creams from which samples were examined had set up gastro-enteritis in boys employed by the Post Office. The London County Council (General Powers) Act, 1902, which came into force on November 1, contains clauses relating to ice-creams, regulating their manufacture, &c., and notices in Italian have been printed for distribution among the vendors.

WITH the publication of the October number (vol. ii. No. 4), the *Journal of Hygiene* completes its second volume and its second year of issue. Messrs. Wright and Windsor contribute a paper upon the bactericidal effect of human blood *in vitro*, and find that whereas human blood-serum has a powerful bactericidal action upon the typhoid bacillus and cholera vibrio, it is without action upon the *M. pyogenes*, *B. pestis* and *M. melitensis*. Dr. Haldane details the results of a lengthy experimental investigation upon the air of factories and workshops, Prof. Tunnicliffe discusses the digestibility of the various albuminous constituents of human milk and its substitutes, and Dr. Ritchie concludes his survey of the current theories regarding immunity.

PIOUSLY minded people have a tendency to accept as ancient anything which pretends to be a monument of Biblical history; as a consequence of this trait, Jewish shekels and half-shekels have been forged and even invented to supply the demand. An interesting exposure of these frauds is given by Mr. G. F. Hill in the *Reliquary and Illustrated Archaeologist* for October. There are other illustrated papers in this journal dealing with ecclesiastical architecture and stone-carving.

APART from the superstition bound up with the use of native medicinal remedies of the North American Indians, it is probable that their knowledge of herbs is much more extensive than that of the white man. Mr. V. K. Cheshunt, who has endeavoured to elicit from the Indians of Mendocino County, California, trustworthy information respecting the uses to which they put various indigenous plants, attributes our knowledge of *Cascara sagrada* to these tribes and suggests that other plants, such as Ceanothus, Croton and Eriogonum, would well repay investigation. The diet of the inland tribes is peculiar, as they regard young clover shoots as a delicacy, and make use of acorns and the variety of horsechestnut known as "buckeye" for making a porridge or baking into bread. The method adopted is to pound up the seeds into very fine flour and wash out the tannin and other stringent ingredients with water. A porridge or thick soup is formed by boiling the flour, while a favourite recipe for making bread consists in mixing the dough with red clay. The product is a heavy, black, cheese-like substance, in which the clay probably absorbs the oil and converts the last trace of tannin into a more digestible form. Another curious custom previously in vogue was the use of poisonous plants, soap root and turkey mullein, which were thrown into streams to poison the fish. These were then caught and eaten without any deleterious consequences.

NEW fields for research are continually opening up; the last illustration of this is the discovery by Prof. G. Elliot Smith that it is possible to map the convolutions of the brains of non-mummified ancient Egyptians. The brain is naturally preserved in the vast majority of the bodies in Egyptian cemeteries from predynastic to recent Coptic, the favourable conditions being burial in dry soil and removal from all direct access to the air. Prof. Elliot Smith gives an illustrated preliminary paper on the natural preservation of the brain in the ancient Egyptians in the *Journal of Anatomy and Physiology* (vol. xxxvi. p. 375). In a memoir, which will be published in a short time, he intends to give a full account of the structure of the brain in the predynastic and protodynastic Egyptians.

IN the Report of the Madras Museum for 1901–1902, the appointment of the director, Mr. E. Thurston, as superintendent of the Ethnographic Survey of Madras is an announcement which will be read with satisfaction by all anthropologists. The papers on the hill and other primitive Madras tribes already published by Mr. Thurston have placed him in the first rank among the students of anthropology and ethnography, and he will now doubtless have fuller opportunities of pursuing these subjects. Anthropological studies have, it appears, an amusing, if not a somewhat embarrassing, aspect in Madras. When on tour in one district, for example, Mr. Thurston was reputed to be collecting for the Victoria Memorial, inoculating for the plague and recruiting for the Boer war, the measurements that he took giving rise to the idea that he was an army tailor! The ethnographic reports of native assistants are, moreover, not exactly what they should be, as witness the following:—"They know how to make fire; *i.e.*, by friction of wood as well as stone, &c. They take a triangular cut of stone and one flat oblong size flat. They hit one another with the maintenance of coir or copper, then fire sets immediately and also by rubbing the two barks frequently with each other they make fire."

THE account of the "Plants of Chatham Island," which formed the subject of an address by Mr. L. Cockayne to the members of the New Zealand Institute, not only possesses the interest which attaches to the impressions obtained by a personal visit, but is additionally so as it is still possible to trace the original vegetation and study the changes which are taking place owing to the introduction of animals and foreign plants. A remarkable and regrettable instance of the latter is the almost complete annihilation of the plant well named *Myosotidium nobile*, which originally lined the shore just above high-water mark. The sheep feed on the leaves and the pigs grub up the rhizomes, and now this plant is limited to quite a few localities. A striking feature of the island is the large Te Whanga lagoon, which occupies about one-third of the island. This, however, is not so important botanically as the swamps, which represent a transition stage from lagoon or lake to drier localities which rapidly become forest lands. Not the least curious feature, and one which has been noted but not satisfactorily explained in other countries, is the occurrence of plants with xerophytic characters growing in the swamps. Such an one is a peculiar Restiaceous plant, *Leptocarpus simplex*, which grows in the wettest parts, while another is *Olearia traversii*, which, however, may be taken as an indication that the swamp is passing into a dry condition.

MESSRS. JAMES SWIFT AND SON have sent to us, for trial, one of their compound microscopes of recent type, fitted with their newly patented "Ariston" fine-adjustment. The essence of this is the setting of the micrometer-screw and its milled head upon a closed tube, which, like a jacket, surrounds the pillar. By the attachment to the head of this jacket of a couple of levers, upon the upper part of which the screw reacts by means of a fine point, there is assured a successful elimination of the troublesome side-movement resulting from a bending of the metal composing the limb when the fine-adjustment is subjected to pressure. In thus ensuring to the operator the comfort of absolute rigidity, the conditions employed give with a coarse screw a slow rate of speed and a very delicate result. The apparatus is entirely satisfactory, and can be fitted to certain of Messrs. Swift's microscopes at small cost. It is worthy their newer mechanical stage, their ruled "finder," and the devices, simple but effectual, which they have from time to time introduced into the construction of their instruments for compensation in wear and tear. In these and other similar matters of recent years, Messrs. Swift have shown themselves constantly on the alert for improvement. In the excellence of their $\frac{1}{12}$-in. homogeneous oil immersion, they have produced an English-made lens of first-rate capacity which is a marvel of cheapness; and it must not be forgotten that in the early days of the modern student's microscope they were the first to introduce the Jackson type of stand, just as we believe it was the Englishman Collins who similarly first produced the iris-diaphragm, which, like it, was a triumph for British manufacture.

THE Report of the U.S. National Museum, under the direction of the Smithsonian Institution, for the year ending June 30, 1900, is, as usual, remarkable for the many interesting papers it contains and the wealth of beautifully executed illustrations which accompany them. The first part of the volume contains the report of the assistant secretary, and includes sections contributed by the head curators of the departments of anthropology, biology and geology. Part ii. makes up nearly 600 of the 738 pages to which the report runs; it contains seven contributions, some of which may fairly be called monographs. Mr. W. H. Holmes, head of the anthropological department of the museum, describes his anthropological studies in California, his contribution being illustrated with fifty excellent plates. The pictures of the baskets made by the Tulare Indians and the scenes showing incidents in their everyday life are particularly fine. An exhaustive study of aboriginal American harpoons, in which they are treated as a study in ethnic distribution and invention, is by Dr. O. T. Mason, the curator of the division of ethnology. Nineteen plates and nearly a hundred figures accompany this article. The Commissioner of the Imperial Maritime Customs Service of China, Mr. A. E. Hippisley, gives a sketch of the history, with twenty-one plates, of ceramic art in China, and supplies a catalogue of the Hippisley collection of Chinese porcelains. The remaining papers are, "Contributions to the History of Musical Scales," by Mr. C. K. Wead, of the U.S. Patent Office; "A Collection of Hopi Ceremonial Pigments," by Mr. W. Hough; a "Descriptive Catalogue of the Collections of Gems in the U.S. National Museum," by Mr. Wirt Tassin; and a catalogue of the meteorite collection, by the same author.

MESSRS. C. GRIFFIN AND CO., LTD., have recently published a ninth edition, revised and enlarged, of Prof. A. Jamieson's "Elementary Manual on Steam and the Steam Engine." From the same publishers we have received the fifth edition of Prof. Jamieson's "Elementary Manual of Applied Mechanics," which has also been enlarged.

A NUMBER of stereoscopic slides of scientific interest have been prepared by Messrs. Erdmann and Schanz, Bedford Hill, Balham, London, S.W. Among the subjects represented are type studies from India and Ceylon, hoar-frost scenes and wild animals. A compact and effective stereoscope with aluminium hood is supplied by the same firm.

TWO more volumes belonging to the *Scientia* series, published in Paris by M. C. Naud, have been issued. One, No. 14 of the biological series, by Prof. A. Imbert, of the University of Montpellier, is entitled "Mode de Fonctionnement économique de l'Organisme." The other, No. 20 of the physico-mathematical series, is by M. H. Laurent, "Sur les principes fondamentaux de la Théorie des Nombres et de la Géometrie." Each volume is a short monograph giving the present state of knowledge of the subject surveyed.

THE thirty-fourth volume of the *Proceedings* of the London Mathematical Society, which has now been published, contains the papers communicated to, or read before, the Society from March, 1901, to April, 1902, and some of the contributions included in the publication are of high mathematical interest. We have also received the second volume of "Mathematical Questions and Solutions from the *Educational Times*." The collection is edited by Miss Constance Marks, and is supplemented by papers and solutions which have not hitherto been published.

THE volume containing the physical papers of the late Prof. Henry A. Rowland, the preparation of which for publication was announced in April of this year, is now nearly ready for distribution to its subscribers. It has been edited under the direction of a committee, consisting of President Remsen, Prof. Welch and Prof. Ames, who have made every effort to present to the world, in a suitable form, this memorial of their colleague. The price of the volume will be one guinea per copy for orders sent in advance of publication, after which the price will be increased. Orders may be sent to Prof. Joseph S. Ames, Johns Hopkins University, Baltimore, Maryland.

A BRILLIANT address on "The Rise of the Experimental Method in Oxford" was delivered by Prof. Clifford Allbutt before the Oxford University Scientific Club last May, as the ninth Robert Boyle lecture. An abstract of the address was given in these columns on May 22 (p. 90), and readers of it could not fail to be struck by the richness and charm of the style in which Prof. Allbutt dealt with his subject. The complete discourse, which has now been published by Mr.

Henry Frowde at the price of one shilling net, should be obtained by everyone interested in the history of science.

In a communication published in the May number of the *Transactions* of the American Microscopical Society, Messrs. Whipple and Parker discuss the connection between the amounts of oxygen and carbonic acid dissolved in natural waters and the occurrence in these of microscopic organisms. It has long been known that exhaustion of nitrates takes place in ground water supporting a vigorous growth of algæ, and it has been assumed that nitrates are the fundamental factor in the development of these. Nitrates are indeed important, but the inadequacy of this explanation became manifest when it was observed that some water, comparatively poor in nitrates, at times supported large growths of algæ. The authors point out the apparent importance of carbonic acid, and express the opinion that the algæ are influenced by it more than by the nitrates. The study of the number of organisms in water at different depths has given some interesting results. Water taken from Lake Cochituate was found to contain the following numbers of Mallomonas per cubic centimetre :—

Depth in feet ...	0	10	30	30	40	50
No. of organisms	0	0	1454	548	112	88

At the surface and throughout the circulating water above the thermocline, oxygen was abundant, but carbonic acid was absent. Near the bottom of the lake there was carbonic acid, but no oxygen, whereas just below the thermocline both gases were present, and as Mallomonas is a chlorophyll-bearing organism it found there conditions favourable for its development.

The additions to the Zoological Society's Gardens during the past week include two Kusimanses (*Crossarchus obscurus*), a White-crested Tiger Bittern (*Tigrisoma leucolophum*), a Great-billed Touracou (*Turacus macrorhynchus*), a Sharpe's Wood Owl (*Syrnium nuchale*) from West Africa, presented by Mrs. Hurst; a Mute Swan (*Cygnus olor*), a White-fronted Goose (*Anser albifrons*), four Widgeon (*Mareca penelope*), two Pintails (*Dafila acuta*), four Pochards (*Fuligula ferina*), six Common Ducks (*Anas boscas*) European, two Black Swans (*Cygnus atratus*) from Australia, presented by Mr. W. N. McMillan; a Persian Gazelle (*Gazella subgutterosa*) from Central Asia, presented by Mr. B. T. Ffinch; two Emperor Boas (*Boa imperator*) from Central America, presented by Dr. Hans Gadow, F.R.S.; a Thick-tailed Opossum (*Didelphys crassicaudatus*) from La Plata, a Blue-fronted Amazon (*Chrysotis oestiva*) from South America, deposited.

OUR ASTRONOMICAL COLUMN.

Variation in Magnitude of α Orionis.—Mr. D. E. Packer, of Birmingham, has recorded, in a letter to No. 1961 of the *English Mechanic*, the observation that α Orionis is increasing in brightness. Although a known variable, its general variations for the past thirty years have been so minute as to attract no particular attention, but Mr. Packer says that, on the night of October 15, the star was distinctly brighter than Capella and only slightly less bright than Sirius.

Herschel recorded very marked variations in the magnitude of this star between 1836 and 1840, and Sir W. Huggins noticed variations in its spectrum during a second period of variability, 1849–1852. Mr. J. E. Gore confirms Mr. Packer's observations.

The Nebula around Nova Persei.—Prof. C. D. Perrine publishes, in the *Bulletin* (23) of the Lick Observatory, several reproductions, and the measures, of the excellent photographs of the nebula around Nova Persei which were obtained with the Crossley reflector, and he also discusses the striking changes observed in the condensations of the nebula.

From measurements of the negatives obtained on March 29, 1901, and January 10–11, 1902, respectively, it appears that the inner ring of nebulosity is expanding radially, at an average rate of 1″·4 per day, whilst the outer ring is similarly expanding 2″·8 per day. These measurements of the inner ring would carry it back to the Nova on February 8, 1901, whilst the outer ring is similarly carried back on February 16–17; both the plates give the same dates. This does not imply the prior formation of the inner ring, for, considering the uncertainties of measurement, Perrine suggests their contemporary origin.

Many suggestions have been made to explain the apparent velocities of parts of the nebula, the two chief explanations being the transition of material particles, and the propagation of a wave of light through, and reflection from, the fine particles of matter making up the nebula. The former seems unlikely, because the movement contains a large tangential factor, whilst the latter theory would have to presume largely variant velocities of the light waves, a presumption which is inconsistent with our present knowledge of light. In order to test the "reflection" theory, Prof. Perrine introduced a double-image prism between the plane mirror of the Crossley reflector and the photographic film, and found that the light was not polarised, *i.e.* the two images were of equal intensity. On polarising the light from α Lyræ and treating it in the same manner, he found that the mirrors of the instrument had practically no effect on polarised light.

The final result points to the existence of little or no polarisation in the light from condensation D, and, with less certainty, in that from condensation A, and therefore refutes the reflection theory.

Coronal Disturbance and Sun-Spots.—In No. 98 of *Popular Astronomy*, Prof. Perrine demonstrates the close connection between the coronal disturbance, photographed at Sumatra during the total eclipse of 1901, and the group of sun-spots and extensive faculæ which came round the limb of the sun on May 19.

From photographs of the solar disc obtained at Dehra-Dun, India, between May 18 and 28, inclusive—of which copies were kindly supplied to Prof. Perrine by the Astronomer Royal—it is seen that a fairly large group of spots and faculæ came round the limb on May 19, and that at the time of the eclipse this group would be very near to the limb. The position angle of the spot, as projected on to the limb, was 60°·2, whilst that of the apex of the coronal disturbance was 60°·0, and during the eleven days under observation this was the only group of spots photographed. This shows conclusively that the spot and the coronal disturbance were in the same line of sight, and further reductions have shown the probability that the origin of the coronal disturbance was also near to the limb at the time. The long, thread-like prominence seen projected almost tangentially from the sun's limb during the eclipse appears to have emanated from the same group of spots and faculæ, so that, in this case at least, all these phenomena appear to have had a common origin.

This aggregation of related phenomena seemed to point to the possibility of the existence of a great disturbance in the solar atmosphere on this date, and a further investigation was made in order to discover if any measurable displacement of the coronal masses took place in the disturbed region. The photographs compared were taken at an interval of five minutes, and no measurable displacement can, with certainty, be traced thereon; from this we may conclude that the velocity across the line of sight was less than twenty miles per second. A comparison between the photographs obtained at Mauritius and Sumatra, respectively, with an interval of one-and-a-half hours, would probably decide this question of movement.

The Variable Star 13, 1902, Lyræ.—Further observations of this Algol variable have given the following results :—

Approximate position for 1900, 19h. 12m. 31s. +32° 14′·8. Range of magnitudes, 10·98 to about 12·8. Period, 3d. 14h. 22m. 23s.·5.

The Variable Star Committee of the Astronomische Gesellschaft has assigned to this star the designation R.V. Lyræ (*Astronomische Nachrichten*, No. 3821).

New Variable Star, 15, 1902, Delphini.—Dr. Anderson, of Edinburgh, has communicated to No. 3821 of the *Astronomische Nachrichten* his observation that a star, not mentioned in the B.D., but having the approximate position R.A. = 20h. 34m. 43s., Dec. = + 11° 21′·5 (1855·0), has proved to be a variable.

Assigning the magnitudes 9·5, 9·7 and 11·2 to B.D. + 11°·4353, B.D. + 11° 4358, and a star having the approximate position